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FACT SHEET

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RANGES

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A range is an essential kitchen household appliance with endless choices in size, type, features and price. The estimated service (life expectancy) of a gas range is 13 years; electric, 12 years. Basic selection considerations, construction, special features information and energy tips for efficient use may help you determine which range is best suited for your needs, preferences and budget allowances.

Selection Considerations

Fuel source. Consider the cost of operation. Cooking appliances use about 5 percent of the energy used in the home. To decide whether a gas or an electric range would be most economical, compare the purchase price, operating cost and installation cost for each type. Check the label for the estimated annual energy operation cost.

When comparing relative costs of gas and electricity, gas will prove cheaper than electricity if the cost per therm (100 cu. ft.) is less than 12 times the cost of electricity per kilowatt hour.

Consider the fuel available where the range will be. The cost of installing an adequate electric circuit or gas line may off-set the savings from using a less expensive utility.

Electric suface elements are about twice as efficient in fuel use as gas surface burners. More heat is lost into the room with a gas range than with an electric one. About 80 percent of the electricity used is converted to useful heat; about 40 percent of the heat produced from gas is effective in cooking food. If both fuels are economically feasible, consider personal cooking preferences. A dual fuel system may be desired, using separate built-in units such as a gas cook top and an electric oven.

Type and size. Match the range to family needs and kitchen space. Types available include free-standing, eye-level, split-level, slide-in, drop-in and built-in. Ranges come in three sizes: the standard range, 36 to 42 inches wide; the 30-inch range (most common); and the apartment model, 19 to 24 inches wide.

Seals. Gas ranges should carry the American Gas Association seal of approval. This assures that the range will give safe and efficient performance and is of substantial and durable construction.

Electric ranges should have the Underwriters' Laboratories seal of approval. Look for this information at the front of the range: manufacturer's name or trademark, catalogue number equivalent, and safety electrical rating.

Warranties. Study the manufacturers' product warranties. Keep the warranty contract for future reference. Answer these questions before purchasing a range:

- Does the warranty cover the entire product or only certain parts ? Is labor included?
- Who is responsible for repairs? The dealer? A service agency ? The manufacturer?
- Who pays for what under the warranty? Parts? Labor? Shipping charges?
- How long does the warranty last on the range? On individual parts?

Construction, Use and Features

Compare basic range construction features in different price categories. Check durability, usability and cleanability against the purchase price. Welded steel panels form most range frames. The outer finish may be porcelain or resin-based enamel with

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stainless-steel or chrome trim. Check the amount of insulation used to keep the outer surface cool when the oven is hot. Increased insulation provides more efficient cooking.

Surface Units

Range tops. Conventional range tops are porcelain enamel or steel. Some models use stainless steel, chrome or a more stain-resistant titanium enamel coating.

Gas. Many new gas range models are equipped with an automatic ignition system, referred to as "pilotless," electric, electronic or solid state. The new ignition is an alternative to the pilot light method for igniting gas when burners are turned on.

Thermostatically controlled units also are available. To measure temperature accurately, the sensing device backed by a spring must press against the utensil bottom. Reasonably flat pans are needed for accurate control. When desired utensil temperature is reached, the fuel supply is cut off. When the temperature drops below the selected temperature, fuel is again supplied.

Burners should be easily removed for cleaning purposes. Grates are usually cast iron covered with porcelain enamel, which makes them more attractive, easier to keep clean and rust resistant.

Electric. The standard surface unit has five or more heat levels. Infinite heat control also is available, in which the heat output is determined by how long the element is energized. Heat is controlled by cycling the electric input on and off. Certain range models have thermostatic controls.

Smooth-top. Glass-ceramic materials used in smooth-top range surfaces have unique characteristics that make them appealing. Smooth-tops can withstand extremely hot and cold temperatures. Some smooth-tops have thermostatically controlled surface units, others infinite controls. The hard, nonporous surface resists staining, releases soils more readily and is relatively scratch resistant. Heating elements have a design in the glass ceramic and are beneath a glass-ceramic panel which reflects a slight color change (often yellow) beginning at temperatures around 480 degrees F. and returns to normal color when cool.

Heat transfer and retention are key factors in smooth-top cooking. Glass-ceramic materials heat more slowly and retain heat longer than conventional cooking units.

Smooth-top surfaces provide the most efficient heat transfer if utensil size matches heating element size and if there is good contact between utensil bottom and heating area. Because utensil size and bottom flatness are important in smooth-top cooking, some manufacturers recommend special utensils for best performance.

Despite the surface, smooth-top ranges may pose cleaning problems. Mineral deposits from cooking liquids and steam condensate may appear as a yellow or gray discoloration on the surface. Use covered utensils to prevent spills and wipe wet spots before they cook dry. Regular use of special non-abrasive cleansers, as recommended in the use-and-care manual, simplifies cleaning and avoids surface scratches.

Metal markings may appear when soft metal (aluminum or copper) utensils are used. Remove these marks with special cleaning agents if a mild non-abrasive cleanser does not work.

Induction. Another smooth-top range is the induction (cool-top) range; however, the cooking principle is different. The cooking utensil is heated, which in turn heats the food. The range surface stays cool or at most gets heat transferred from the heated pan.

In a conventional range, a coiled wire (nichrome) heats up as it resists electrical flow through it. As more electricity flows, more heat is produced. In the cool-top range, electricity is converted to a high-frequency current that produces current in the bottom of metallic utensils with magnetic characteristics. Steel and iron utensils are commonly used on induction ranges. Heat control is very sensitive and immediate in an induction range.

Ovens

Electric and gas ranges have many construction features in common. The frames are usually one-piece, welded steel units. The outside sections and oven lining are porcelain enamel or stainless steel.

The sides, back, top and bottom of the oven have insulating materials between the lining and frame. The oven door should have the same insulation as the walls. Self-cleaning and continuous-cleaning ovens have more insulation than conventional ranges.

Oven racks are of rust-resistant metals such as stainless steel, aluminum or chromium-plated steel. Grids close enough for adequate support of small utensils are useful, as are lock stops to prevent tipping when racks are pulled out.

Other items to consider in purchasing an oven are:

- Size of oven(s) — depth, width and height
- Number of ovens needed
- Number of rack positions
- Oven light — accessibility and protection from accidental breakage
- Removable oven door for manual cleaning
- Positions available for broiler pan
- Broiler height

Ovens in gas and electric ranges are about equal in performance and convenience. A gas range permits hot combustion gases to flow through the oven cavity. Such an oven is inherently inefficient in operation and requires many more heat units of gas to bake a product than it does heat units of electricity. The oven in an electric range can be totally closed off except for a small top vent to permit the steam escape. Thus, most heat produced by electricity goes into heating the oven and its contents.

Several automatic ignition systems are used in gas ovens and broilers. They include:

- Standing pilot — ignites when oven control is turned on
- Electric ignition — hot wire ignites pilot when control is turned on. Electricity is necessary for ignition.
- Electronic ignition — tiny sparks light a pilot when control is turned on. Pilot then ignites oven burner. Electricity also is needed for the range to operate.

The broiler element in an electric range produces a reasonably even heat pattern over a relatively large area. With gas, the area over which the heat is evenly distributed is generally limited and is dependent on the oven broiler-burner shape.

Gas broiling is done with the door closed. Electric broiling is done with the door ajar, which increases the amount of heat dissipated into the kitchen and makes working at the range surface uncomfortable.

A convection oven uses a forced, recycled air flow through the oven to accelerate the baking and cooking processes, thus reducing annual energy costs. Estimates are that up to 60 percent of cooking time and up to 50 percent of energy can be saved when using a convection range. It eliminates preheating, shortens cooking time and lowers cooking temperature. All types of utensils can be used. Gas and electric versions are available. The oven cost, however, is much higher than conventional ones.

Special Features

Automatic Oven Cleaning Options

Two automatic cleaning processes are available: the self-cleaning (pyrolytic) and the continuous-cleaning (catalytic). Automatic oven cleaning may not achieve the same results as cleaning a conventional oven by hand. The feature does not eliminate the need for wiping up spillovers, heavy grease spatters and the area around edges of the door.

Self-cleaning. Oven soil is reduced to a light ash during a separate, high-heat cycle (between 850 degrees and 1100 degrees F.). Metal racks and drip bowls may discolor (blue tint) if self cleaned. Most manufacturers recommend they be washed by hand although a few have been designed for oven cleaning. Heavy insulation and door locks provide safeguards against the high heat of the cycle. At the end of the cleaning cycle, the light ash can be easily removed with a damp rag or sponge. The cycle usually lasts from 2 to 4 hours including time to cool down after cleaning. Increased insulation makes self-cleaning ovens relatively energy efficient. This feature is widely available in electric ranges and in some gas ranges.

Continuous-cleaning. Oven soil is gradually reduced to a presentably clean condition on specially treated surfaces during normal baking or roasting operations. The oven's interior lining looks similar to conventional finishes, but feels rougher. The oven liner panels contain a chemical catalyst, which is mixed into the enamel coating. The catalyst promotes oxidation (burning) at low temperature. Food spills in the oven (carbon compounds) combine with oxygen from the catalyst to produce carbon dioxide, which is released into the air.

Continuous-cleaning finishes require more special care than self-cleaning ovens. The system works most efficiently at temperatures of 475 degrees F. and above for longer time. The oven door and floor need special attention because of lower temperatures. The sides and tops of continuous cleaning ovens usually remain fairly clean. Soil on the oven bottom must be scrubbed away. Do not use harsh abrasives, regular oven cleaners or abrasive pads. Follow manufacturer's instructions closely. Some manufacturers use regular, scrubbable porcelain enamel on the oven bottom, or provide heavy-duty sheets of aluminum foil that can be replaced when dirty.

Other Features

- Removable control knobs, tilt-top cooking surfaces and plug-in service units make cleaning easier.
- A no-turn broiler that broils on both sides at once, a rotisserie in the oven for spit roasting of meat and poultry and a meat probe which functions like an automatic meat thermometer, letting the meat cook to the exact degree of doneness.
- Programmed or automatic cooking allows the consumer to select the appropriate cooking time and oven temperature. Cooking begins at a pre-set time. When the cooking time has elapsed, the oven drops to a low "holding" temperature that prevents further cooking and keeps food warm until served.

Energy Tips for Efficient Use

For greatest energy efficiency in a range, consider the following:

- A self-cleaning oven has extra insulation that gives cooler operation during normal use and may reduce operating costs.
- Pilotless ignition on gas ranges reduces annual energy consumption about 25 percent. It also reduces extra heat and moisture in the home generated by gas pilots.
- A convection oven reduces annual energy costs by one-half.

Consider these points when using the oven:

- Use for a complete meal, or prepare double or triple batches of food. Do not open door, since the temperature drops 25 to 75 degrees F. each time it is opened.
- Use self-cleaning oven cycle late in the evening instead of during "peak load" periods, or use immediately after cooking when oven is already warm.
- In summer, avoid self-cleaning oven cycle when the home is warm because additional energy is required for cooling.
- Glass and glass-ceramic cooking utensils absorb radiant heat well and allow cooking at temperatures 25 degrees lower than metal cooking levels.

For range top cooking:

- Use pans with flat bottoms that fit the unit or burner to avoid wasting heat.
- Turn off the electric unit 3 to 4 minutes before cooking is completed to avoid wasting heat.
- Keep reflector pans clean.
- Generally, start foods at high setting and finish cooking at lower heat. Once boiling or cooking begins, high heat does not speed up cooking, especially in smoothtop cooking.
- Use thermostatically controlled surface units if available. Their heat sensing ability cycles power off and on, yet maintains proper cooking temperatures.

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